

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): An apparatus for measuring breathability and comfort level of a shoe, comprising:

a rigid structure made of self-supporting heat-conducting material that duplicates a contour of a foot for supporting a shoe to be tested, said rigid structure being divided into at least three rigid structure regions that are thermally insulated from each other,

heating means for heating autonomously each one of said at least three regions of said rigid structure to a presettable temperature,

at least one cladding ~~for~~ surrounding said rigid structure, ~~which is~~ said cladding including cladding regions corresponding to the rigid structure regions and being made of a soft material whose structure is permeable to liquids and adapted capable of absorbing water and distributing the water over an entire surface of the rigid structure that it surrounds,

sensor means for sensing an external temperature of ~~each region~~ said cladding regions ~~of said at least one cladding~~ that correspond to said at least three rigid structure regions,

supply means for ~~metered~~ metering a supply of water to said rigid structure surrounded by said at least one cladding,

measuring means for determining a level of electric power dissipated from said heating means and keeping constant the sensed external temperature of said cladding regions.

Claim 2 (Currently Amended): The apparatus of claim 1, further comprising humidity sensing means for sensing relative humidity in each of said at least three regions.

Claim 3 (Original): The apparatus of claim 1, wherein said rigid structure made of self-supporting material is made of aluminum.

Claim 4 (Currently Amended): The apparatus of claim 1, wherein said heating means are ~~constituted by~~ comprised of resistive elements that are powered electrically to provide adjustable temperature.

Claim 5 (Original): The apparatus of claim 4, comprising thermoregulators for adjusting temperature of said resistive elements.

Claim 6 (Currently Amended): The apparatus of claim 4, wherein said resistive elements are embedded in the self-supporting material that ~~constitutes~~ comprises said rigid structure.

Claim 7 (Currently Amended): The apparatus of claim 1, wherein said sensor means are ~~constituted by~~ comprised of thermocouples that are fixed to said at least one cladding.

Claim 8 (Original): The apparatus of claim 1, wherein said at least one cladding is made of soft material that is capable of absorbing water in an amount equal to approximately 400% by weight and of distributing said water on the surface of the rigid structure.

Claim 9 (Original): The apparatus of claim 1, wherein said at least one cladding is made of a fabric.

Claim 10 (Original): The apparatus of claim 1, wherein said rigid structure is divided into five regions comprising toe, inner sole, outer sole, instep and heel regions.

Claim 11 (Original): The apparatus of claim 1, comprising silicone diaphragms for dividing said at least three regions.

Claim 12 (Currently Amended): The apparatus of claim 2, wherein said supply means for ~~metered~~ metering a supply of water to said at least three regions of said rigid structure surrounded by said at least one cladding are constituted by a precision pump driven by an electronic control unit.

Claim 13 (Original): The apparatus of claim 12, wherein said precision pump is peristaltic.

Claim 14 (Currently Amended): The apparatus of claim 1, comprising: a supporting frame that is composed of a footing and a beam; a first actuator fixed on said beam and configured to ~~for vertical reciprocating translational motion of~~ vertically move said rigid structure; a second ~~reciprocating translational motion~~ actuator attached to the supporting frame ~~[[;]]~~ and configured to horizontally move a carriage ~~that supports a free roller~~ ~~[[,]]~~ said carriage being horizontally slideable on said footing, following the actuation thereof the carriage supporting a free roller for movement with the carriage. ~~by said second motion actuator~~

Claim 15 (Currently Amended): The apparatus of claim 14, further comprising a plate is configured to be slideable on a surface of said free roller for providing a sole resting region for the shoe to be tested during ~~stroke~~ movement of said carriage that supports said free roller, said plate being rigidly coupled to ~~said frame and to~~ said roller so as to vary inclination of the sole resting region from an inactive position, in which an end of said plate

that is directed toward a heel of the shoe is higher than an opposite end thereof, to a substantially horizontal position of said plate as the roller is moved with the carriage from a starting position, said plate being provided with return means for returning of the plate to said inactive position ~~that corresponds to a position step in which the shoe is fully raised~~ when the roller is moved with the carriage back to the starting position .

Claim 16 (Original): The apparatus of claim 15, wherein said plate is rigidly coupled to said beam at the end thereof that is directed toward the heel of the shoe by way of said return means.

Claim 17 (Original): The apparatus of claim 16, wherein said return means comprise elastic elements.

Claim 18 (Original): The apparatus of claim 16, wherein said return means comprise hydraulic pistons.

Claim 19 (Currently Amended): The apparatus of claim 15, comprising at least one guide configured to allow ~~for~~ controlled sliding of said plate, arranged on the surface of said free roller.

Claim 20 (Currently Amended): The apparatus of claim 14, further comprising a load cell that is interposed between said first ~~reciprocating translational motion~~ actuator and said rigid structure.

Claim 21 (Currently Amended): The apparatus of claim 14, further comprising speed control means for controlling speed and synchronization of said first and second ~~reciprocating translational motion~~ actuators.

Claim 22 (Currently Amended): The apparatus of claim 14, further comprising a first stroke limit sensor and a second stroke limit sensor for said carriage, which are arranged respectively at a front and at a rear position on said footing ~~with respect to said rigid structure~~.

Claim 23 (Currently Amended): The apparatus of claim 14, wherein said first ~~reciprocating translational motion~~ actuator is ~~constituted by~~ a pneumatic cylinder provided with a stem.

Claim 24 (Currently Amended): The apparatus of claim 14, wherein said second ~~reciprocating translational motion~~ actuator is ~~constituted by~~ a stemless pneumatic cylinder.

Claim 25 (Currently Amended): The apparatus of claim 21, wherein said speed and ~~synchronization~~ control means comprise pressure control valves.

Claim 26 (Currently Amended): The apparatus of claim 22, further comprising a pneumatic valve that regulates flow of air within said first and second ~~reciprocating translational motion~~ actuators and cooperates with said first and second stroke limit sensors.

Claim 27 (Original): The apparatus of claim 14, further comprising ventilation means for ventilation of said rigid structure.

Claim 28 (Original): The apparatus of claim 27, wherein said ventilation means are constituted by an electric fan.

Claim 29 (Currently Amended): The apparatus ~~for constant humidity tests~~ of claim 12, wherein in testing configuration, the shoe to be tested is fitted on said rigid structure ~~with~~ surrounded by said at least one cladding and with said relative humidity sensing means arranged ~~thereon~~ on said rigid structure, the humidity sensing means sending a signal to said control unit, which drives said precision pump, with said pump being activated when humidity internal to said rigid structure drops below a set minimum value in order to send water to said rigid structure and return humidity about said minimum set value.

Claim 30 (New): An apparatus for measuring breathability and comfort level of a shoe, comprising:

a rigid structure made of self-supporting heat-conducting material that duplicates a contour of a foot for supporting a shoe to be tested, said rigid structure being divided into at least three rigid structure regions that are thermally insulated from each other,

heating means for heating autonomously each one of said at least three regions of said rigid structure to a presettable temperature,

at least one cladding surrounding said rigid structure, said cladding including cladding regions corresponding to the rigid structure regions and being made of a soft material whose structure is permeable to liquids and capable of absorbing water and distributing the water over an entire surface of the rigid structure that it surrounds,

sensor means for sensing an external temperature of said cladding regions that correspond to said rigid structure regions,

supply means for metering a supply of water to said rigid structure surrounded by said at least one cladding,

measuring means for determining a level of electric power dissipated from said heating means and keeping constant the sensed external temperature of said cladding regions,

wherein said heating means are comprised of resistive elements embedded in the self supporting material of the rigid structure, and said resistive elements powered electrically to provide adjustable temperature.

Claim 31 (New): The apparatus of claim 30, further comprising humidity sensing means for sensing relative humidity in each of said at least three regions.

Claim 32 (New): The apparatus of claim 30, wherein said rigid structure made of self-supporting material is made of aluminum.

Claim 33 (New): The apparatus of claim 30, comprising thermoregulators for adjusting temperature of said resistive elements.

Claim 34 (New): The apparatus of claim 30, wherein said sensor means are comprised of thermocouples that are fixed to said at least one cladding.

Claim 35 (New): The apparatus of claim 30, wherein said at least one cladding is made of soft material that is capable of absorbing water in an amount equal to approximately 400% by weight and of distributing said water on the surface of the rigid structure.

Claim 36 (New): The apparatus of claim 30, wherein said at least one cladding is made of a fabric.

Claim 37 (New): The apparatus of claim 30, wherein said rigid structure is divided into five regions comprising toe, inner sole, outer sole, instep and heel regions.

Claim 38 (New): The apparatus of claim 30, comprising silicone diaphragms for dividing said at least three regions.

Claim 39 (New): The apparatus of claim 31, wherein said supply means for metering a supply of water to said at least three regions of said rigid structure surrounded by said at least one cladding are constituted by a precision pump driven by an electronic control unit.

Claim 40 (New): The apparatus of claim 39, wherein said precision pump is peristaltic.

Claim 41 (New): The apparatus of claim 30, comprising:
a supporting frame that is composed of a footing and a beam,
a first actuator fixed on said beam and configured to vertically move said rigid structure,
a second actuator attached to the supporting frame
and configured to horizontally move a carriage on said footing, the carriage supporting a free roller for movement with the carriage.

Claim 42 (New): The apparatus of claim 41, further comprising a plate configured to be slideable on a surface of said free roller for providing a sole resting region for the shoe to be tested during movement of said carriage that supports said free roller, said plate being rigidly coupled to said roller so as to vary inclination of the sole resting region from an inactive position, in which an end of said plate that is directed toward a heel of the shoe is higher than an opposite end thereof, to a substantially horizontal position of said plate as the roller is moved with the carriage from a starting position, said plate being provided with return means for returning of the plate to said inactive position when the roller is moved with the carriage back to the starting position.

Claim 43 (New): The apparatus of claim 42, wherein said plate is rigidly coupled to said beam at the end thereof that is directed toward the heel of the shoe by way of said return means.

Claim 44 (New): The apparatus of claim 43, wherein said return means comprise elastic elements.

Claim 45 (New): The apparatus of claim 43, wherein said return means comprise hydraulic pistons.

Claim 46 (New): The apparatus of claim 42, comprising at least one guide configured to allow controlled sliding of said plate, arranged on the surface of said free roller.

Claim 47 (New): The apparatus of claim 41, further comprising a load cell that is interposed between said first actuator and said rigid structure.

Claim 48 (New): The apparatus of claim 41, further comprising speed control means for controlling speed and synchronization of said first and second actuators.

Claim 49 (New): The apparatus of claim 41, further comprising a first stroke limit sensor and a second stroke limit sensor for said carriage, which are arranged respectively at a front and at a rear position on said footing.

Claim 50 (New): The apparatus of claim 41, wherein said first actuator is a pneumatic cylinder provided with a stem.

Claim 51 (New): The apparatus of claim 48, wherein said second actuator is a stemless pneumatic cylinder.

Claim 52 (New): The apparatus of claim 48, wherein said speed control means comprise pressure control valves.

Claim 53 (New): The apparatus of claim 49, further comprising a pneumatic valve that regulates flow of air within said first and second actuators and cooperates with said first and second stroke limit sensors.

Claim 54 (New): The apparatus of claim 41, further comprising ventilation means for ventilation of said rigid structure.

Claim 55 (New): The apparatus of claim 54, wherein said ventilation means are constituted by an electric fan.

Claim 56 (New): The apparatus of claim 39, wherein in testing configuration, the shoe to be tested is fitted on said rigid structure with said at least one cladding and surrounded by relative humidity sensing means arranged on said rigid structure, the humidity sensing means sending a signal to said control unit, which drives said precision pump, with said pump being activated when humidity internal to said rigid structure drops below a set minimum value in order to send water to said rigid structure and return humidity about said minimum set value.

Claim 57 (New): An apparatus for measuring breathability and comfort level of a shoe, comprising:

a rigid structure made of self-supporting heat-conducting material that duplicates a contour of a foot for supporting a shoe to be tested, said rigid structure being divided into at least three rigid structure regions that are thermally insulated from each other,

heating means for heating autonomously each one of said at least three regions of said rigid structure to a presettable temperature,

at least one cladding surrounding said rigid structure, said cladding including cladding regions corresponding to the rigid structure regions and being made of a soft material whose structure is permeable to liquids and capable of absorbing water and distributing the water over an entire surface of the rigid structure that it surrounds,

sensor means for sensing an external temperature of regions of said at least one cladding that correspond to said at least three rigid structure regions,

supply means for metering a supply of water to said rigid structure surrounded by said at least one cladding,

measuring means for determining a level of electric power dissipated from said heating means and keeping constant the sensed external temperature of said cladding regions,

wherein said sensor means are comprised of thermal couples that are fixed to said at least one cladding.

Claim 58 (New): An apparatus for measuring breathability and comfort level of a shoe, comprising:

a rigid structure made of self-supporting heat-conducting material that duplicates a contour of a foot for supporting a shoe to be tested, said rigid structure being divided into at least three rigid structure regions that are thermally insulated from each other,

heating means for heating autonomously each one of said at least three regions of said rigid structure to a presettable temperature,

at least one cladding surrounding said rigid structure, said cladding including cladding regions corresponding to the rigid structure regions and being made of a soft material whose structure is permeable to liquids and capable of absorbing water and distributing the water over an entire surface of the rigid structure that it surrounds,

sensor means for sensing an external temperature of regions of said at least one cladding that correspond to said at least three rigid structure regions,

supply means for metering a supply of water to said rigid structure surrounded by said at least one cladding,

measuring means for determining a level of electric power dissipated from said heating means and keeping constant the sensed external temperature of said cladding regions,

wherein said at least one cladding is made of soft material that is capable of absorbing water in an amount equal to approximately 400% by weight and of distributing said water on the surface of the rigid structure.

Claim 59 (New): An apparatus for measuring breathability and comfort level of a shoe, comprising:

a rigid structure made of self-supporting heat-conducting material that duplicates a contour of a foot for supporting a shoe to be tested, said rigid structure being divided into at least three rigid structure regions that are thermally insulated from each other,

silicon diaphragms for dividing said at least three regions,

heating means for heating autonomously each one of said at least three regions of said rigid structure to a presettable temperature,

at least one cladding surrounding said rigid structure, said cladding including cladding regions corresponding to the rigid structure regions and being made of a soft material whose structure is permeable to liquids and capable of absorbing water and distributing the water over an entire surface of the rigid structure that it surrounds,

sensor means for sensing an external temperature of regions of said at least one cladding that correspond to said at least three rigid structure regions,

supply means for metering a supply of water to said rigid structure surrounded by said at least one cladding,

measuring means for determining a level of electric power dissipated from said heating means and keeping constant the sensed external temperature of said cladding regions,

Claim 60 (New): An apparatus for measuring breathability and comfort level of a shoe, comprising:

a rigid structure made of self-supporting heat-conducting material that duplicates a contour of a foot for supporting a shoe to be tested, said rigid structure being divided into at least three rigid structure regions that are thermally insulated from each other,

heating means for heating autonomously each one of said at least three regions of said rigid structure to a presettable temperature,

at least one cladding surrounding said rigid structure, said cladding including cladding regions corresponding to the rigid structure regions and being made of a soft material whose structure is permeable to liquids and capable of absorbing water and distributing the water over an entire surface of the rigid structure that it surrounds,

sensor means for sensing an external temperature of regions of said at least one cladding that correspond to said at least three rigid structure regions,

supply means for metering a supply of water to said rigid structure surrounded by said at least one cladding,

measuring means for determining a level of electric power dissipated from said heating means and keeping constant the sensed external temperature of said cladding regions,

a supporting frame that is composed of a footing and a beam:

a first actuator fixed on said beam and configured to vertically move said rigid structure,

a second actuator attached to the supporting frame and configured to horizontally move a carriage on said footing supporting a free roller for movement with the carriage,

and a carriage that supports a free roller, said carriage being horizontally slideable on said footing following the actuation of the carriage by said second motion actuator.

Claim 61 (New): The apparatus of claim 60, further comprising humidity sensing means for sensing relative humidity in each of said at least three regions.

Claim 62 (New): The apparatus of claim 60, wherein said rigid structure made of self-supporting material is made of aluminum.

Claim 63 (New): The apparatus of claim 60, wherein said heating means are comprised of resistive elements that are powered electrically to provide adjustable temperature.

Claim 64 (New): The apparatus of claim 63, comprising thermoregulators for adjusting temperature of said resistive elements.

Claim 65 (New): The apparatus of claim 63, wherein said resistive elements are embedded in the self-supporting material that comprises said rigid structure.

Claim 66 (New): The apparatus of claim 60, wherein said sensor means are comprised of thermocouples that are fixed to said at least one cladding.

Claim 67 (New): The apparatus of claim 60, wherein said at least one cladding is made of soft material that is capable of absorbing water in an amount equal to approximately 400% by weight and of distributing said water on the surface of the rigid structure.

Claim 68 (New): The apparatus of claim 60, wherein said at least one cladding is made of a fabric.

Claim 69 (New): The apparatus of claim 60, wherein said rigid structure is divided into five regions comprising toe, inner sole, outer sole, instep and heel regions.

Claim 70 (New): The apparatus of claim 60, comprising silicone diaphragms for dividing said at least three regions.

Claim 71 (New): The apparatus of claim 61, wherein said supply means for metering a supply of water to said at least three regions of said rigid structure surrounded by said at least one cladding are constituted by a precision pump driven by an electronic control unit.

Claim 72 (New): The apparatus of claim 71, wherein said precision pump is peristaltic.

Claim 73 (New): The apparatus of claim 60, further comprising a plate configured to be slideable on a surface of said free roller for providing a sole resting region for the shoe to be tested during movement of said carriage that supports said free roller, said plate being rigidly coupled to said roller so as to vary inclination of the sole resting region from an inactive position, in which an end of said plate that is directed toward a heel of the shoe is higher than an opposite end thereof, to a substantially horizontal position of said plate as the roller is moved with the carriage from a starting position, said plate being provided with return means for returning of the plate to said inactive position when the roller is moved with the carriage back to the starting position .

Claim 74 (New): The apparatus of claim 73, wherein said plate is rigidly coupled to said beam at the end thereof that is directed toward the heel of the shoe by way of said return means.

Claim 75 (New): The apparatus of claim 74, wherein said return means comprise elastic elements.

Claim 76 (New): The apparatus of claim 74, wherein said return means comprise hydraulic pistons.

Claim 77 (New): The apparatus of claim 73, comprising at least one guide configured to allow controlled sliding of said plate, arranged on the surface of said free roller.

Claim 78 (New): The apparatus of claim 60, further comprising a load cell that is interposed between said first actuator and said rigid structure.

Claim 79 (New): The apparatus of claim 60, further comprising speed control means for controlling speed and synchronization of said first and second actuators.

Claim 80 (New): The apparatus of claim 60, further comprising a first stroke limit sensor and a second stroke limit sensor for said carriage, which are arranged respectively at a front and at a rear position on said footing.

Claim 81 (New): The apparatus of claim 60, wherein said first actuator is a pneumatic cylinder provided with a stem.

Claim 82 (New): The apparatus of claim 60, wherein said second actuator is a stemless pneumatic cylinder.

Claim 83 (New): The apparatus of claim 79, wherein said speed control means comprise pressure control valves.

Claim 84 (New): The apparatus of claim 80, further comprising a pneumatic valve that regulates flow of air within said first and second actuators and cooperates with said first and second stroke limit sensors.

Claim 85 (New): The apparatus of claim 60, further comprising ventilation means for ventilation of said rigid structure.

Claim 86 (New): The apparatus of claim 85, wherein said ventilation means are constituted by an electric fan.

Claim 87 (New): The apparatus of claim 71, wherein in testing configuration, the shoe to be tested is fitted on said rigid structure with said at least one cladding and surrounded by said relative humidity sensing means arranged on said rigid structure, the humidity sensing means sending a signal to said control unit, which drives said precision pump, with said pump being activated when humidity internal to said rigid structure drops below a set minimum value in order to send water to said rigid structure and return humidity about said minimum set value.